

CLAIMS

1. An image data collection control method for collecting multiple pieces of image data from an image data collection range including a periodically moving part of an object to be examined, the method comprising:
 - 5 a periodic motion data obtaining step of obtaining periodic motion data indicating a change of a periodic motion with time;
 - an image data collection condition setting step of setting an image data collection condition for allowing the image data of the image data collection range to have a time resolution within a desired range;
 - 10 an image data collection position control step of relatively moving at least a part of the image data collection range and a collection position of the image data such that the part of the range and the collection position are superimposed on each other within a time when the image data of the image data collection range has a time resolution within the desired range based on the image data collection condition; and
 - 15 an image data collecting step of collecting the image data of at least the part of the image data collection range on the image data collection position.
2. The image data collection control method according to claim 1, wherein the image data collection condition setting step includes:
 - a projected image obtaining step of obtaining a projected image of the object,
 - 20 and
 - an image data collection range designating step of designating the image data collection range based on the projected image.
3. The image data collection control method according to claim 2, wherein in the image data collection range designating step, the image data collection range is
25 designated by designating a starting position and an end position of collection of the image data in the projected image.
4. The image data collection control method according to claim 2, wherein the image data collection condition setting step includes, before the image data collection

range designating step, a time resolution estimating step of estimating a fluctuation in a time resolution of the image data with time based on the periodic motion data, and

5 in the image data collection range designating step, a time resolution graph and the projected image are superimposed on each other, the time resolution graph indicating the fluctuation in the time resolution of the image data with time.

5. The image data collection control method according to claim 4, wherein in the image data collection range designating step, the desired time resolution range in the time resolution graph is superimposed so as to correspond to the image data collection range in the projected image.

10 6. The image data collection control method according to claim 4, wherein in the time resolution graph, at least points ranging from a start point corresponding to a start time of image data collection in the time resolution graph to an end point corresponding to a stop time of image data collection are respectively superimposed on positions ranging from a starting position to an end position of image data collection in the
15 projected image.

7. The image data collection control method according to claim 4, wherein in the image data collection range designating step, input is received for designating or changing at least one of a position of the time resolution graph and a position of a part of the graph, and at least one of the image data collection range and the desired time
20 resolution range is designated or changed based on the input.

8. The image data collection control method according to claim 4, wherein in the image data collection range designating step, a numeric value indicating a position on the projected image is displayed, the position corresponding to at least one of points of the time resolution graph, input is received to change the numeric value, and relative
25 positions of the time resolution graph, at least one of the points of the graph, and the projected image are changed based on the input.

9. The image data collection control method according to claim 1, wherein in the periodic motion data obtaining step, the periodic motion data is obtained without performing a step for generating the image data in the image data collecting step.

10. The image data collection control method according to claim 4, wherein in the image data collection position control step, the image data collection range and the image data collection position are relatively moved so as to keep a positional relationship between an elapsed time in the time resolution graph and the image data collection range in the projected image, and

the relative movement and the image data collecting step are simultaneously performed.

11. The image data collection control method according to claim 1, wherein the image data collection condition setting step includes:

a step of determining a suitable change of the periodic motion data such that the image data of the image data collection range has a time resolution within the desired range, and

a step of displaying a change of the periodic motion data with time and the suitable change.

12. The image data collection control method according to claim 11, wherein a combination of the suitable change and a speed of the relative movement is calculated in the image data collection condition setting step, and the image data collection range and a collection position of the image data are relatively moved in the image data collection position control step.

13. The image data collection control method according to claim 11, wherein the periodic motion data obtaining step is repeated until the change of the periodic motion data falls below a predetermined value.

14. The image data collection control method according to claim 1, wherein in at least one of the periodic motion data obtaining step and the image data collecting step, at least one of factors changing the periodic motion is conveyed at least to the object.

15. The image data collection control method according to claim 1, wherein the periodically moving part is a heart, and

the periodic motion data is at least one of a breath holding time or an average breath holding time, the number of times of simulation training in which a heart rate or a pulse rate is increased, stabilized, or reduced by breath holding, a change or an average change in heart rate or pulse rate due to breath holding, the number of times of simulation training in which the number of periodic motions is increased, stabilized, or reduced by administration of a contrast medium, a change or an average change in the number of periodic motions due to administration of the contrast medium, and a fluctuation in heart rate or pulse rate with time in past scanning of the heart.

16. An image data collection system for collecting multiple pieces of image data from an image data collection range including a periodically moving part of an object to be examined, the system comprising:

a periodic motion data obtaining means for obtaining periodic motion data indicating a change of a periodic motion with time;

an image data collection condition setting means for setting an image data collection condition for allowing the image data of the image data collection range to have a time resolution within a desired range;

an image data collection position control means for relatively moving at least a part of the image data collection range and a collection position of the image data such that the part of the range and the collection position are superimposed on each other within a time when the image data of the image data collection range has a time resolution within the desired range based on the image data collection condition; and

an image data collecting means for collecting the image data of at least the part of the image data collection range on the image data collection position.

17. The image data collection system according to claim 16, wherein the image data collection condition setting means estimates a fluctuation in the time resolution of the image data with time based on the periodic motion data before designating the image data collection range, and

5 the image data collection condition setting means superimposes a time resolution graph and the projected image, the time resolution graph indicating the fluctuation in the time resolution of the image data.

18. The image data collection system according to claim 16, wherein the periodic motion data obtaining means obtains the periodic motion data without generating the
10 image data, and

the system further comprises:

a periodic motion data recording means for recording the change of the periodic motion data with time and an information on a sequence of obtaining the periodic motion data in a synchronous manner, and

15 an information display means for displaying the recorded change of the periodic motion data with time and the information on the sequence of obtaining the periodic motion data in a synchronous manner.

19. The image data collection system according to claim 18, wherein the periodic motion data recording means further records information on the object, and

20 the image data collecting means collects the image data using the periodic motion data when the periodic motion data on the object is recorded in the periodic motion data recording means.

20. The image data collection system according to claim 16, wherein the image data collecting means is an X-ray CT apparatus comprising:

25 an X-ray source for emitting an X-ray, an X-ray detector which is opposed to the X-ray source with the object being interposed between the X-ray source and the X-ray detector and detects the X-ray to output X-ray transmission data, a rotating means capable of rotating with the X-ray source and the X-ray detector, a table on which the object is laid, a table controller for controlling a table moving speed for moving the table,

an image processing means for generating a tomogram of the object based on the X-ray transmission data, and a display means for displaying the tomogram,

the periodic motion data obtaining means is a heart rate meter for measuring and obtaining a heart rate of the object,

5 the image data collection condition setting means calculates a combination of a change of the periodic motion data and the table moving speed to obtain the desired time resolution, and

the table controller moves the table according to the table moving speed.

21. The image data collection system according to claim 16, wherein the image data
10 collecting means is a magnetic resonance imaging apparatus including:

a control unit having a predetermined scanning sequence, a magnetic field
generating means for generating, in response to control of the control unit, a gradient
magnetic field and a high frequency magnetic field in a static magnetic field space in
which the object is laid, and a signal processing means for measuring an NMR signal
15 generated from the object and imaging the signal, and

the periodic motion data obtaining means obtains a body movement navigation
signal of the object.